RAPID RIVER HATCHERY

1995 CHINOOK BROOD YEAR REPORT

by

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ABSTRACT

The Rapid River trap operated from March 15 to September 13, 1995. From May 22 to August 26, 129 spring chinook *Oncorhynchus tshawytscha* were collected. This included 70 adults and 59 jacks. Oxbow Hatchery trapped and transferred 35 spring chinook from Hells Canyon to Rapid River Fish Hatchery. The sex ratio for the 164 combined Rapid River and Snake River return was 61 adult males (37.20%), 43 females (26.22%), and 60 jacks (36.58%). The age-class structure of the 129 spring chinook returning to Rapid River was 59 three-year-olds (45.73%), 61 four-year olds (47.29%), and 9 five-year-olds (6.98%). The age-class ratio of the fish received from Oxbow Hatchery was one three-year old (2.86%), 30 four-year-olds (85.71%), and 4 five-year-olds (11.43%).

In addition to spring chinook other species were trapped in 1995. A total of four summer chinook (all adult males) were trapped from June 17 to September 5. Summer chinook were released into Rapid River above the trap. The age-class composition of the summer component of the 1995 salmon run was three four-year-olds, and one five-year-old. There were 47 wild and 58 hatchery steelhead *O. mykiss* trapped from March 18 to July 2. The sex ratio of the returning steelhead was 20 wild males, 27 wild females, 32 hatchery males, and 26 hatchery females. Wild steelhead were released above the trap. Hatchery steelhead were released into the Little Salmon River. A total of 234 bull trout *Salvelinus confluentus* were trapped from May 8 to September 7, and released into Rapid River above the trap. In 1995 there was no chinook fishery on the Little Salmon River, and no tribal fishery on Rapid River.

Prespawning mortality of the salmon brood stock was four adult males (2.4%), eight females (4.9%) for a total of 12 fish or 7.3 percent of the fish held. This is the second lowest in the history of this hatchery (The lowest was 2% in 1968).

Spawning took place from August 7 to October 10, 1995. A total of 35 females were spawned producing 132,002 green eggs. Total survival to eye-up was 115,265 eyed eggs. Overall eye-up was 87.3% and average fecundity was 3,771 eggs per female. As spawning progressed, 16,402 eyed eggs from five females that tested moderate or high for bacterial kidney disease (BKD) by enzyme-linked immunosorbant assay (ELISA) were transferred to Clearwater Hatchery. The total inventory remaining at Rapid River Hatchery was 98,863 eyed eggs from 113,427 green eggs.

Marking of brood year 1995 fingerlings started on September 23, 1996. The marking crew reported adipose fin-clipping 86,072 fingerlings (-8.4% from hatchery inventory). This number was used for inventory at the start of the final rearing period. During marking 40,517 of the 86,072 fish were also Passive Integrated Transponder (PIT) tagged.

From March 17, to April 10, 1997, 85,840 smolts (4,185 lbs) were released into Rapid River. This is a survival rate of 99.7% for the rearing period after marking. Feed conversion for the 1995 brood year spring chinook was 1.38 prior to the start of volitional release.

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INTRODUCTION

Funding Source

Rapid River Hatchery was constructed in 1964 by Idaho Power Company (IPC) to mitigate for loss of spring chinook salmon resulting from the construction of Brownlee, Oxbow, and Hells Canyon dams on the Snake River. Mitigation mandated by the Federal Energy Regulatory Commission required IPC to transplant a run of spring chinook salmon from the Snake River to the Salmon River drainage and to provide funds for the production of three million spring chinook salmon smolts annually at this facility. These fish are designated for release into Rapid River and into the Snake River below Hells Canyon Dam. Rapid River Hatchery is staffed and operated by the Idaho Department of Fish and Game (Department) and funded by IPC.

Location

Rapid River Hatchery is located in Idaho County seven miles southwest of the community of Riggins. The hatchery is located on Rapid River, a tributary of the Little Salmon River. Travel distance for salmon to the ocean is approximately 600 river miles.

OBJECTIVES

The objectives of Rapid River Hatchery are:

1. To produce three million spring chinook salmon smolts annually. The average size is to be approximately 22.7 g (20 fish/lb). These fish are to be released into Rapid River and the Snake River below Hells Canyon Dam.

2. To trap and spawn adult spring chinook salmon returning to Rapid River.

3. To evaluate various strategies and techniques for rearing spring chinook salmon.

4. To provide eggs and/or fry for supplementation purposes.

FACILITY DESCRIPTION

Fish rearing facilities at Rapid River Hatchery consist of 50 double vertical stack incubators, 12 outdoor concrete raceways (6 ft x 90 ft), and six earthen rearing ponds with concrete side walls: Pond 1A and 1B (42 ft x 188 ft each), Pond 2A and 2B (35 ft x 197 ft each), and Pond 2C and 2D (37 ft x 173 ft each). Adult salmon brood stock holding facilities consist of one concrete holding pond HP-1 (80 ft x 25 ft) and one earthen holding pond HP-2 (40 ft x 150 ft). This provides space for holding up to 4,000 adult salmon prior to spawning. This year we used six vats (8 ft x 2 ft x 1.3 ft) for the initial part of the early rearing period. These were received on loan from the Eagle Fish

Hatchery, Eagle, Idaho and returned after fry were transferred to raceways. Production capacities by unit are listed in Appendix 1. Rearing space by unit is shown in Appendix 2.

Rapid River Hatchery facilities include a fish trap located on Rapid River approximately 1.5 miles downstream from the hatchery. It is designed to trap and hold upstream migrating adult fish. The trap consists of a permanent wooden velocity barrier, a seven step fish ladder, and a two stage trap. Adult salmon can be transferred from the trap by means of an Alaska Steep Pass Ladder to a 500-gallon bucket that is lifted by an overhead hoist to a 1,000 gallon tank truck for transport to the hatchery. The trap facility allows unimpeded migration of anadromous and resident fish around the velocity barrier during periods when trapping operations are not in progress.

RECOMMENDED FACILITY IMPROVEMENTS

As part of our objective to evaluate production methods, we have identified two specific areas where improvement can be made. One is adult salmon handling and the other is general hygiene and disease control. Average prespawning mortality at Rapid River Hatchery from 1970 to 1994 was 18.3%. Examination of prespawning mortality records show that a sharp increase occurs after first sort and subsequent handling of the adults. Our current method of gathering fish for sorting involves netting all adult fish in a large seine each spawn day. This results in severe handling stress twice each week during the spawning season. An improved method for crowding adult fish would reduce prespawning mortality. This would require facility modification to provide a better environment for holding adult salmon. The other area of improvement involves the way water is supplied to rearing pond one. All water entering pond one must first pass through outdoor raceways. Consequently, we can never dry up the raceway system to disinfect it, and fish in pond one receive second-use water. When the raceways are not in use, they form a reservoir for the accumulation of bacteria, detritus, and other material. The solution to this problem would be a simple bypass of the raceway system to supply water to the rearing pond. To attempt to address part of this problem a modification of the raceway head ditch was constructed in December 1996. This modification will allow dewatering of the raceways when not in use, facilitate disinfection the raceway system and expedite flushing of the head ditch.

WATER SUPPLY

Water Source

Rapid River originates in Adams County and flows through an undeveloped canyon before reaching the hatchery. The drainage is protected as part of the Wild and Scenic Rivers Act and is not subjected to perturbations, such as logging or road building. Rapid River generally provides adequate water for rearing spring chinook salmon, however, the length and steep nature of the drainage make it a highly variable river. Spring runoff and flash floods can be violent and carry a tremendous volume of silt into the hatchery. Specific water measurement data are recorded by the National Forest Service (NFS) and have been made available through their Grangeville Idaho office (unpublished). Over the period from May 15 to July 25, when spring chinook were arriving at Rapid River Trap, flows varied from 345 cfs through the annual high of 841 cfs and back down to 236 cfs.

This is relatively normal run off for this drainage. Flow during fish marking (September 23-30, 1996) is not available from the NFS at this time. Water temperature is also normally quite variable. The minimum in the January is about 34°F and maximum in August can exceed 60°F. The late high water and lower than normal water temperatures may be associated with a late peak and the short duration of the spring salmon run in 1995. Mean monthly water temperatures were normal during April and May, but were over four degrees cooler than the ten-year average during June, July, and August, 1995. Pond temperatures during adult holding are shown in Appendix 3.

Water Supply

Hatchery water is obtained through one 30-inch and one 24-inch pipeline. A five-foot high wooden diversion dam provides the necessary hydraulic head. Rapid River Hatchery has specific water rights under state license to 28 cfs for the hatchery facility and 18.6 cfs for the fish trap. This water is diverted from Rapid River and then returned after passing through the hatchery. Rearing units operate on gravitational flow. Water for the incubation system is pumped from the headrace by one of two 7.5-horsepower electric pumps. A gasoline-operated pump and a gravitational flow filter bed provide water during electrical failures. Water quality parameters are listed in Appendix 4.

STAFFING

Rapid River Hatchery is staffed by three permanent employees, a Fish Hatchery Manager II, an Assistant Fish Hatchery Manager, and a Fish Culturist. Approximately five seasonal employees are hired each year from February through November. The Summer Youth Employee Training Program may provide one or two employees to assist with grounds maintenance. Housing accommodations include three residences for the permanent staff and a 65' x 14' mobile home for seasonal employees.

FISH PRODUCTION

Adult Collection

Spring Chinook Salmon Returns To Rapid River

The Rapid River fish trap operated from March 15 through September 13, 1995. Water conditions were normal and presented no problem for the fish or the trapping operation. The trap was closed down on May 30 and May 31, over night due to high water and turbidity. Operations were restarted the following morning both days. The trap was also out of operation for a few hours for cleaning on May 16, June 12, and June 14. Spring chinook were collected for spawning purposes and transported to holding ponds at the hatchery. Summer chinook, steelhead, and bull trout were collected and released. Summer chinook, wild steelhead, and bull trout were released into Rapid River above the trap. Hatchery steelhead were released into the Little Salmon River about one mile above its confluence with Rapid River.

The first spring chinook was trapped on May 22 and the last on August 26, 1995 (Appendices 5, and 6). The majority of the run followed a steep normal curve. The peak of the 1995 run was during the third week of June with 85% of the spring chinook arriving between June 25, and July 15. This year 129 spring chinook (70 adults and 59 jacks) were trapped. Only jacks with adipose fin (AD) or left ventral fin (LV) clips were designated spring chinook. All unmarked jacks were designated summer chinook. Prior to July 16 all adults were designated spring chinook. After July 15 all unmarked adults were designated summer chinook. The adult spring chinook mark ratio was; 89 AD clips, 12 LV clips, and 28 unmarked. The fish were transported to holding pond 1 (HP-1) and held for spawning. A total of 35 spring (one AD clip, one LV clip, and 33 unmarked) salmon were received from Oxbow Hatchery this year which brought the total number of fish in holding at Rapid River Hatchery to 164. Fish received from Oxbow Hatchery were all right operculum punched for identification. This year we continued to combine holding of the Rapid River returns with fish that returned to the Snake River. Our HP-1 pond is concrete and provides a better environment for holding prior to spawning because it allows less stressful handling during the sorting and spawning process (see the section on recommended facility improvements above). We believe these considerations out weigh any statistical problems created by mixing the fish. Fork length measurements are taken at the time of trapping so separate age-class information is available for the two groups. However, sexual dimorphism does not appear until later in the summer after the groups are combined. For this reason the sex ratio is reported for all fish placed in holding. The sex ratio of the 164 total fish (129 Rapid River fish plus 35 Snake River fish) was 61 adult males (37.20%), 43 females (26.22%), and 60 jacks (36.58%). Polymodal analysis of length frequencies and coded-wire tag (CWT) return data from the 1995 run were used to determine age-class criteria. Age-class composition of the 129 Rapid River chinook was 59 (45.73%) three-year-olds (0-60 cm); 61 (47.28%) four-year-olds (61-83 cm), and 9 (6.98%) five-year-olds (84+ cm), (Appendix 7, and 8). This year no adult chinook were trapped with radio transmitters, jaw tags, or (Passive Integrated Transponder) PIT tags.

Injuries were documented throughout the trapping season. When multiple injuries were present on the same fish, they were recorded separately. Injuries consisted of one nitrogen burn, one gill net scar, and 31 other types of injuries (Appendix 9). This year we did not find any gaff wounds or fish hooks.

Hells Canyon Spring Chinook Salmon Returns

The IPC personnel transported 35 chinook from the Hells Canyon trap to Rapid River Hatchery. The age-class composition of the 35 chinook received from Hells Canyon was one three-year-old (2.86%), 30 four-year-olds (85.71%), and 4 five-year-olds (11.43%) (based on the same age-class criteria used for Rapid River returns). The sex ratio of the Hells Canyon run is not available separately because sexual dimorphism is not evident at the time of trapping and operculum punches were not detectable after holding. The sex ratio of the combined Rapid River and Snake River returns was determined during holding at Rapid River Hatchery. For more information see the Oxbow Hatchery Spring Chinook Salmon Run Report for 1995.

Inventory Of Miscellaneous Species

Summer chinook entered the trap from July 17 through September 5, 1995 (Appendices 6, and 10). This component of the Rapid River run included four adult males. These fish were measured to the nearest centimeter fork length (Appendix 8, and 11), injected with antibiotic, then released above the hatchery trap into the Rapid River drainage. Age-class composition of this part of the salmon run was 3 four-year-olds and one five-year-old male.

From March 18 through July 2, 1995, 105 adult steelhead were trapped (Appendices 12, and 13) and measured to the nearest centimeter fork length (Appendices 14, and 15). The steelhead run included 47 wild fish and 58 hatchery fish. The sex-ratio was 20 wild males, 27 wild females, 32 hatchery males, and 26 hatchery females. Steelhead of hatchery origin were transported back to the Little Salmon River and released approximately one mile upstream from its confluence with Rapid River. Wild steelhead were released into Rapid River upstream from the trap.

A total of 234 bull trout were trapped from May 8 through September 7, 1995 (Appendices 16, and 17). These fish ranged in size from 20 cm to 56 cm total length (Appendices 18, and 19). The Department researchers continued a study of bull trout movement this year. Hatchery personnel assisted them with implanting PIT tags, marking, and various other aspects of their study. Further information regarding this study should be obtained from Dan Schill, the Department. An inventory of all species trapped in 1995 is shown in Appendix 20.

Sport And Tribal Harvest

In 1995 there was no chinook fishery on the Little Salmon River. There was also no tribal fishery on Rapid River in 1995.

Holding And Spawning

Adult Treatments

Hatchery personnel removed all fish from the trap daily and processed them on site. Fish were all handled as little as possible and processing was conducted with the fish immersed. The steep pass ladder does not work well with low numbers of fish so this year each fish was processed individually within the trap building. They were anesthetized with 40 ppm MS-222, measured to the nearest centimeter fork length, and injected with antibiotic. Fish placed in holding were marked with a numbered Tyvec tag stapled to the outside of the operculum. This year operculum tags were placed on 162 fish. Of these, 130 (80.2%) were lost. The high tag loss rate raises some question about the relative value of this type of tag for returned adults within the hatchery. Spring chinook fish were transported to the hatchery, summer chinook fish were released above the trap.

This year 107 spring and 4 summer chinook received an intraperitoneal injection of Erythromycin base injectable (Gallimycin-100) at 10 or 20 mg/kg body weight. In May,

Investigational New Animal Drug (INAD) number 6430 for this drug was lifted and the administration of the antibiotic was performed in accordance with veterinary extra label usage by prescription from Dr. Dave Hunter, Department veterinarian at the Caldwell Wildlife Laboratory, Caldwell, Idaho. This eliminated the need for two test dosages and all fish after June 27 were administered 20 mg/kg. The number of fish receiving injections are as follows: 2 spring jacks and 2 spring adults at 10 mg/kg, and 37 spring jacks, 66 spring adults, and 4 summer adults at 20 mg/kg. There were 22 spring jacks that were not given the drug.

All Rapid River and Hells Canyon returns held for spawning were placed in pond HP-1. The holding period extended from May 19 to October 10. Formalin treatments were administered three times each week from June 27 to September 8, to control ectoparasite and reduce prespawning mortality. Formalin treatments consisted of precharging the pond with formalin to 170 ppm, followed by introduction of formalin into inflow water for one hour at a rate of 170 ppm. During the holding and spawning period, water temperatures ranged from 39°F to 56°F (Appendix 3). Carcasses from holding and spawning were frozen then hauled to a landfill via Grangeville, Idaho once each week by the Walco Company.

Prespawning Mortality

The combined prespawning mortality for Rapid River and Hells Canyon chinook was 12 fish or 7.3 percent of the 164 fish placed in holding. After August 17 males were not considered part of prespawning mortality. The sex ratio of prespawning mortalities was four adult males (2.4%) and eight females (4.9%). This is the lowest prespawning mortality since 1968 and the second lowest in the history of this hatchery. The average from 1970 through 1994 was 18.7%. We believe that factors influencing this improvement include holding in HP-1, crowding with racks rather than nets, precharging the formalin treatments, and the generally good condition of the fish upon arrival.

Hatchery personnel performed routine necropsies on all prespawning mortalities. Causal factors for prespawning mortality are shown in Appendix 21. A profile of cumulative prespawning mortality as percent of total fish held is shown in Appendix 22. Snouts were collected from 111 AD or LV clipped fish and sent to the Department Fish Marking Laboratory at Lewiston Idaho, for CWT analysis. Results were: 80 with no tag, and 31 with coded-wire tags. The returned tag numbers are shown in Appendix 23.

Salmon Spawning

A total of 35 female chinook were spawned from August 7 to October 10, producing 132,002 green eggs. Complete egg enumeration and disposition data is compiled in Appendix 24. This year no females were discarded for gross symptoms of Bacterial Kidney Disease (BKD). Each female was sampled during spawning for BKD analysis. The results of Enzyme Linked Immunosorbent Assey (ELISA) tests are shown in Appendix 25. To maximize genetic diversity, we used a split random cross of two males per female. Females were killed with a blow to the head. Eggs from each female were collected in a colander to drain off the ovarian fluid. They were transferred to two separate buckets and fertilized with milt from two different males. Approximately 250 ml of well water was added to activate sperm. Jacks were included at random for fertilization throughout the spawning season. Males were given a left operculum punch to

identify them as having been spawned and then returned to the holding pond for additional use if necessary. The last female spawned on October 10, was spawned with one male. All fertilized eggs were water hardened for 30 minutes in a minimum of 100 ppm Argentyne. After water hardening, eggs were placed in Heath vertical stack incubators with a flow rate of six gpm.

Incubation

Eggs were incubated at a rate of one female per tray to allow segregation of individual fish pending results of ELISA studies.

The total egg take for 1995 was 132,002 eggs from 35 females. This yields an average fecundity of 3,771 eggs per female. After primary pick off of 16,737 bad eggs 115,265 eyed eggs remained for an overall eye-up of 87.3%.

Five of the 35 females spawned tested moderate or high positive for BKD by ELISA. These females produced 18,575 green eggs which yielded 16,402 eyed eggs. After picking and counting the eyed eggs were transferred to Clearwater Fish Hatchery for isolated incubation. The eggs were transferred in "EggTUBE" containers manufactured by the AquaSeed Corporation. " EggTUBEs" were placed in "EggBOX" coolers and transported by Rapid River Hatchery personnel. This group of eggs had an overall eye-up of 88.3% and the average fecundity of the five females was 3,715 eggs per female.

Approximately 98,863 eyed eggs were retained at Rapid River Hatchery. These came from 113,427 green eggs taken from 30 females that tested negative or low for BKD. Overall eye-up for this group was 87.2% and average fecundity of the 30 females was 3,781 eggs per female.

All eggs taken at Rapid River Hatchery were shocked at 500 daily temperature units (DTU) by pouring them from the trays into water and back into trays. They were picked two days later using the salt bath method. A Jensorter egg counter was used to establish inventory numbers. The eggs were returned to clean trays after counting. At 1,000 DTUs, when most of the eyed eggs had hatched, the trays were picked again. A third pick off was performed just prior to ponding. All trays were "rodded" weekly, after eye-up (300 DTUs), to remove silt. Three days each week, formalin was administered to each incubator stack at a rate of 1,667 ppm (1:600) for 15 minutes to retard external mycosis. This procedure was discontinued after each egg lot accumulated 800 DTUs. Mycosis was successfully controlled. Fry were ponded at approximately 1700 DTUs.

Early Rearing

From December 1, 1995 through April 29, 1996, fry were ponded. This year the low inventory allowed initial ponding in indoor vats. To accommodate this rearing technique half the incubator stacks were removed from the incubation building and replaced with six vats that were obtained from the Eagle Fish Hatchery. As each lot reached approximately 1700 DTUs the swim-up fry were transferred to the indoor vats and reared until reaching a density index of 0.3 (Piper, et. al., 1982). Fry were then moved from the incubation building into outdoor raceways at 200 to 800 per pound. To facilitate feed training we limited ponding to just two raceways. As a result, the

raceways were loaded over a period of time from late-February to mid-September and lots were mixed. This yielded a broad size range in each raceway, but had no adverse affects. Average initial raceway loading density was 0.12 and 0.19 (Piper, et. al. 1982) (Appendix 26). Initial water depth was 1.5 feet and water flow was adjusted to 270 gpm. As the fish increased in size, water depth, and flows were increased to a maximum depth of 3 feet and flow of 850 gpm. The fry increased in size to an average weight of 10.66 g (42.53 fish/lb) at the end of the early rearing period. At that time density and flow indices averaged 0.24 and 0.65 respectively (Appendix 27). The fingerlings remained in the raceways until marking when they were transferred to Rearing Pond 2A.

Fry from egg lot one came from a female that tested positive for BKD. They had hatched prior to receiving ELISA results. Department policy prohibited transfer of fry to Clearwater Hatchery so these fish remained at Rapid River Hatchery and were kept separate from their cohorts for the entire rearing cycle. This group remained in the indoor vats until marking when they were transferred to the Rearing Pond 2B catch basin.

Mortality during early rearing from December, 1995 to through September, 1996 was 1,519 fish or 1.8% of the inventory reported at marking.

Final Rearing

Rearing ponds were disinfected with a 200 ppm chlorine bath prior to ponding fish. The fingerlings were transferred from raceways to ponds through four inch irrigation pipe. Fry that came from BKD positive females were moved to the Rearing Pond 2B catch basin, and fry from BKD negative females were moved to Rearing Pond 2A. The marking crew reported that a total of 86,072 spring chinook were marked and moved from September 23 through September 30, 1996. This is a decrease of 8.4% from hatchery inventory. As in the past, hatchery inventory numbers were adjusted by actual count obtained as fish were marked and transfer^{r}ed into the final rearing ponds. Initial pond loading densities are reported in Appendix 28. Fingerlings were ponded at a mean length of 100.6 mm (3.96") and increased to 131.8 mm (5.19") at release. Final rearing densities prior to the initiation of volitional release on March 17, 1997 are shown in Appendix 29. The maximum recommended by the Department for density index is 0.3. The maximum recommended flow index for saturated 45°F water at 2,188 feet above sea level is 2.09. Both these indices were within prescribed limits.

Feed Use And Conversion Data

A total of 2,859 lbs of feed were fed during the early rearing period for a feed conversion of 1.13. Another 2,943.5 lbs of feed were fed during the final rearing period for a feed conversion of 1.75. In all 5,802.5 pounds of BioProducts feed was used for 1995 brood year fish prior to the beginning of volitional release on March 17. The overall feed conversion was 1.38 based on inventory and fish size on March 17. Between March 17 and egress of the last fish on April 10 another 315.5 lbs were fed to maintain vigor and visceral fat. This yields 6,118 lbs total feed, however conversion based on this number would be meaningless due to lack of specific inventory information for the period between March 17 and April 10. We feel that the value of volitional

release far exceeds the need for increased precision of conversion data. Specific data on feed types and sizes used are listed in Appendix 30.

From June to August, 1996 all 1995 brood year fingerlings were fed 2.5% Aquamycin, at a rate of 100 mg Erythromycin per kilogram body weight, per day, for 21 days. This treatment was followed by toxicity testing and was performed according to guidelines set forth in INAD number 4333. Following this treatment mortality began to increase in the segregated group of fish held in the indoor vats. *Acinetobacter* was detected and all fish on station were fed TM-100 (oxytetracycline) at a rate of 3.75g per 100 pounds body weight, per day, for 10 days (see the Fish Health section).

Starting October 1, 1996 all fingerlings were fed a second treatment of 4.5% Aquamycin for 28 days, at a dose of 100 mg per kilogram body weight of Erythromycin, per day. This treatment was performed in accordance with INAD number 4333.

Fish Health

Diseases Encountered And Treatment

This part of the 1995 Brood Year Report is reproduced with permission from Mr. Doug Munson of the Department, Eagle Fish Health Laboratory in Eagle Idaho. The summary of the pre-liberation inspection was reduced from the routine Fish Health Inspection Report for February 27, 1997 accession number 97-038. A summary of Department Health Laboratory results for inspections of brood year 1995 brood stock and juveniles is shown in Appendix 31.

Historically, Rapid River Hatchery had mortalities due to *Renibacterium,* the causative agent of BKD, *Flexibacter psychrophilus,* the causative agent of Cold Water Disease, and external mycosis. In the last three years, a BKD culling/segregation program was implemented at this facility and disease from these agents has disappeared. This year, an egg mass with moderate ELISA optical density was kept and broke with disease due to *Acinetobacter.* The diseased fish were hyper-pigmented and were high in the water column. Signs typical of a septicemia were noticed internally. An acute mortality appeared to be eminent, a fast decision on cause of mortality and treatment was made. Oxytetracycline (OTC) medicated feed (TM-100) was applied successfully and mortality and morbidity dropped drastically. These fish were segregated from the main production group until release.

Organosomatic Index

The organosomatic index in this context is a measure of fish health developed as part of the Autopsy-Based Fish Health/Condition Assessment System (Goede, R. W., and S. Houghton. 1987). A summary of the fish autopsy is shown in Appendix 32.

Acute Losses

Acute losses were limited to the fingerling loss described earlier in this section due to *Acinetobacter.* Medicated feed treatment with OTC limited losses to less than one percent to the effected group.

Other Assessments

Since the implementation of a BKD segregation program, losses to the traditional pathogens of this facility are virtually nonexistent. External mycosis has not been seen since 1993 and possibly will be controlled as long as this segregation program is implemented. Signs of Erythrocytic Inclusion Body Syndrome (EIBS) have not been seen in this brood year.

Fish Marking

Fisheries management protocol requires the adipose fin to be removed from all hatchery reared salmon. The marking crew reported that a total of 86,072 fish were adipose clipped. Coded-wire tags were not used this year. Marking continued from September 23 to September 30, 1996. PIT tags were placed in 40,517 fish concurrent with fin clipping. These fish were released into Rapid River from March 17 through April 10, 1997. During the final rearing period the fish were sampled monthly for a quality check for AD clips. A total of 756 fish were sampled and the results were; 90.5% with clips, .4% without clips, and 9.1% with partial clips. Specific marking information is presented in Appendix 33. For more information regarding marking consult the Annual Release Summary of Marked Salmon and Steelhead published by the Department.

Fish Distribution

Egg Transfers

During 1995, 16,402 eyed eggs from five females were transferred to Clearwater Hatchery for isolated incubation and rearing. On April 15, 1997, 13,470 smolts from these eggs were released into Rapid River by Clearwater Hatchery personnel. At the time of release they were 28.5g (15.9/lb). For more information contact the Department Clearwater Hatchery.

Fingerling Transfers

No brood year 1995 fingerlings were transferred.

Smolt Releases

The total release of brood year 1995 spring chinook from Rapid River Hatchery was 85,840 fish (4,185 lbs). All brood year 1995 smolts were released into Rapid River. All releases took place from March 17 through April 10, 1997.

Volitional smolt releases from Rapid River Hatchery began on March 17, 1997 when approval was granted by the National Marine Fisheries Service (NMFS). Smolts averaged 22.1 g (20.5 fish per pound) and 131.8 mm fork length (5.19"). Rearing densities for smolts at the time of release are listed in Appendix 29. Based on visual observations, we estimate that about 75% of the smolts migrated volitionally. The remaining fish were seined from the ponds as they were dewatered. The last fish emigrated on April 10. Release data is reported in Appendix 34. Survival from marking to release was 99.7% (Appendix 35).

The total cost of production for any specific brood year, is not a straightforward calculation. At Rapid River Hatchery the rearing cycle is 19 months. For any brood year it extends from September when spawning starts to March nineteen months later when the smolts are released. In the past, cost of production has been reported for the total cost incurred by IPC for the entire 19 month period. Overlap in brood year classes caused the total cost for September through March of the first year, and the total cost for September through March of the second year to be reported twice. This resulted in inflated estimates of production cost by reporting total cost for 14 of the 19 months in three successive brood year reports. We are not sure what the best solution to this dilemma might be and this should be the subject of future discussion. For now, we will continue to report the total cost data supplied by IPC.

One way to approach the overlapping rearing cycle would be to pro-rate total cost by a brood years percent of the total inventory. To try this IPC supplied us with total cost broken down by month. Total cost incurred by IPC for the period September 1995 through March 1997 was $587,737.15 or $140.44 per pound of fish released. The total cost pro-rated based on inventory, by month, for the period was $210,395.48 or $50.27 per pound.

The cost per pound this year was a record high. This is due to the record low inventory. Total cost includes variables (e.g., feed cost), but fixed costs by definition fluctuate very little with changes in inventory. This type of overhead is why the cost per pound this year is high while total cost is consistent with other years. Cost of Production data is listed in Appendix 36.

HISTORICAL INFORMATION

As always, we have included some archival information to put this year's report into perspective. Historic information about returns by return year is listed in Appendix 37, and by brood year in Appendix 38. Average feed and growth statistics are listed in Appendix 39. Release and transfer information is listed in Appendix 40.

ACKNOWLEDGMENTS

The crew at Rapid River Hatchery would like to thank Mr. Paul Abbott and the entire fisheries staff at IPC for their support and assistance in helping us to maintain and improve the hatchery facility. We would also like to thank personnel from other Department hatcheries who helped us take eggs during the spawning season, and accolades go to Eagle Hatchery for the lone of their vats. Our gratitude again this year goes to Mr. Roy Kinner and other Department conservation officers for helping with enforcement at the hatchery and for security at the trapping facility. In addition, we extend our appreciation to Doug Munson and the Eagle Fish Health Lab staff for disease diagnostic work at the hatchery, and assistance with preparation of this document. This team effort helps to keep Rapid River a successful hatchery

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APPENDICES

Appendix 1. Rapid River Hatchery Production Capacity.

Rearing Unit	Volume		Carrying Capacity	
Incubators	800	trays	3,200,000	eggs
Raceways (12)	1,890	cubic ft	3,800.000	fry
Rearing Pond #1	54,625	cubic ft	1,000,000	smolts
Rearing Pond #2	92,827	cubic ft	2,000,000	smolts
Adult Holding Pond 1	12,000	cubic ft	1,000	adults
Adult Holding Pond 2	24,000	cubic ft	3,000	adults

Appendix 2. Rapid River Hatchery Pond Volume.

Rearing/holding Area	Volume (cu ft)
Rearing Pond IA	27,496
Rearing Pond 1B	27,129
Rearing Pond 2A	23,858
Rearing Pond 2B	22,607
Rearing Pond 2C	22,468
Rearing Pond 2D	23,894
Adult Holding Pond 1	12,000
Adult Holding Pond 2	24,000

Appendix 3. Adult Holding Pond Temperatures (°F), 1995.

Month	Maximum	Minimum	Average	Ten Year Average
April	51	39	44.5	44.9
May	52	41	45.3	46.5
June	52	41	45.8	50.1
July	56	45	51.0	54.4
August	58	46	51.8	55.7
September	56	44	50.6	51.4

Appendix 4. Rapid. River Water Quality Analysis.

Analyte	PQL	Result	Units
Nitrate/N	0.05	ND	mg/L
Nitrite	0.05	ND	mg/L
Sulfate	1	14	mg/I
Orthophosphate/P	0.05	ND	mg/L
Ammonia/N	0.5	ND	mg/L
Alkalinity	10	74	mg/L as CaCO3
Hardness	10	80	mg/L as CaCO4
pH		7.63	
Hydrogen Sulfide	0.2	ND	mg/L
Chlorine	0.1	ND	mg/L
Arsenic	1	ND	ug/L
Cadmium	1	ND	ug/L
Chromium	1	ND	ug/L
Mercury	1	ND	ug/L
Lead	1	ND	ug/L
Selenium	1	ND	ug/L
Silver	1	ND	ug/L
Iron	30	120	ug/L
Zinc	1	51	ug/L
Cooper	1	ND	ug/L
Aldrin	0.1	ND	ug/L
Endrin	0.1	ND	ug/L
Dieldrin	0.1	ND	ug/L
Heptachlor	0.1	ND	ug/L
Chlordane	0.1	ND	ug/L
Methoxychlor	0.1	ND	ug/L
Lindane	0.1	ND	ug/L
Guthion	0.1	ND	ug/L
Malathion	0.1	ND	ug/L

Testing was performed by Anatek Labs Inc. of Moscow Idaho, February, 1996.

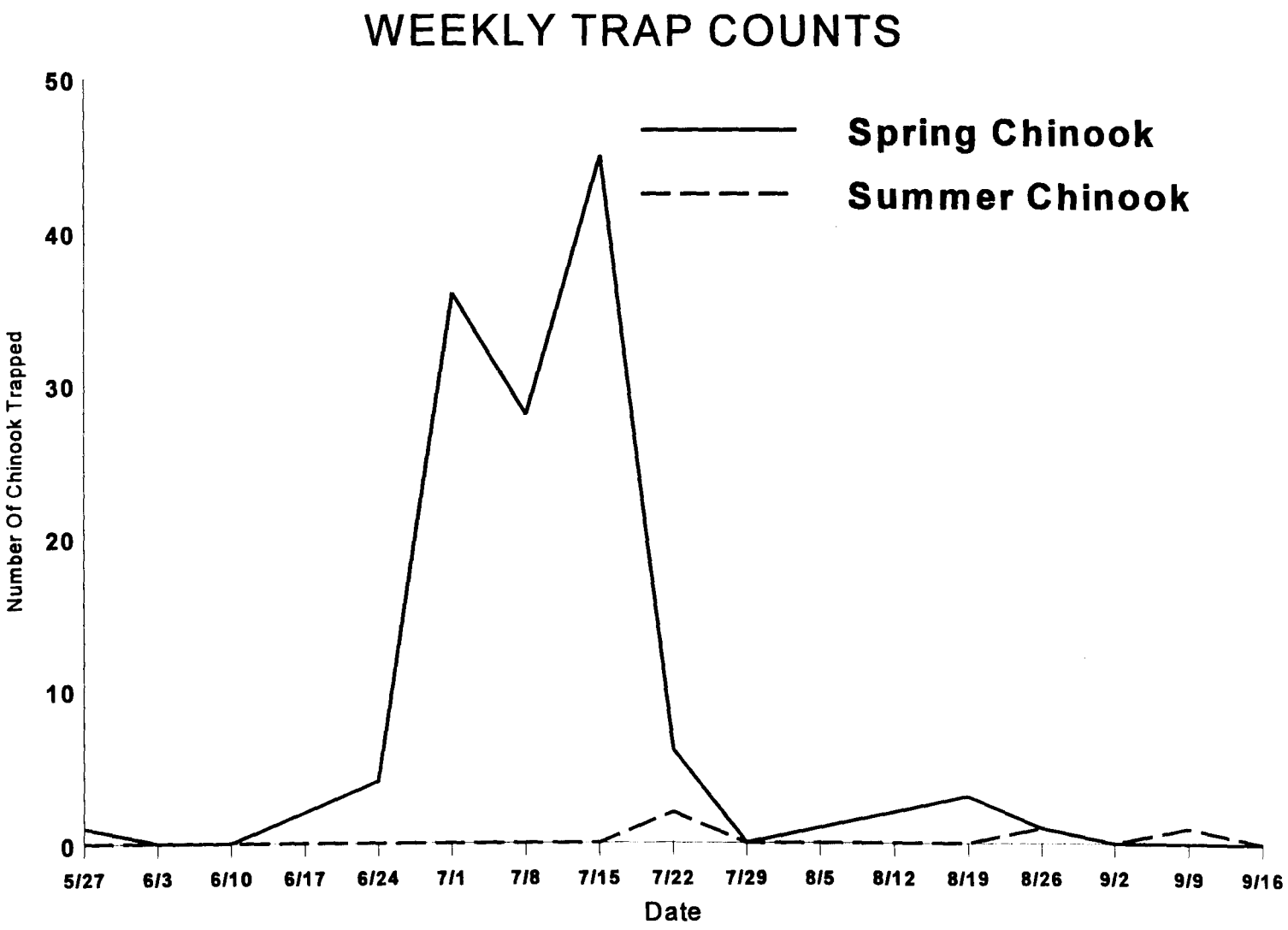
PQL= practical Quantitation Limit

ND = not detected(<PQL)

Appendix 5. Rapid River Spring Chinook Run Timing, 1995.

Week Ending	Number of Fish	Percent of Spring Chinook
May 27	1	0.78
June 3	0	0.00
June 10	0	0.00
June 17	2	1.55
June 24	4	3.10
July 1	36	27.91
July 8	28	21.71
July 15	45	34.88
July 22	6	4.65
July 29	0	0.00
August 5	1	0.78
August 12	2	1.55
August 19	3	2.33
August 26	1	0.78
September 2	0	0.00
Total	129	100.00

Appendix 6. Adult Chinook Returns to Rapid River Trap During 1995.



Appendix 7. Rapid River Spring Chinook Length Frequency, 1995.

Fork Length (cm)	Number of Fish
less than 40	0
40	1
41	1
42	0
43	2
44	4
45	6
46	3
47	7
48	9
49	8
50	4
51	5
52	4
53	2
54	0
55	3
56	0
57	0
58	0
59	0
60	0
61	1
62	0
63	0
64	0
65	1
66	0
67	1
68	1
69	1
70	6
71	2
72	3
73	5
74	8
75	8
76	10
77	3
78	3
79	2
80	1
81	4
82	1
83	0
84	0
85	0
86	0
87	0
88	1
89	3
90	1
91	0
92	0
>92	4
Total Run	129

Sex Composition Data

60 (36.58%)	jacks
61 (37.20%)	males
43 (26.22%)	females
164 (100.00%)	*total

Age-class Data

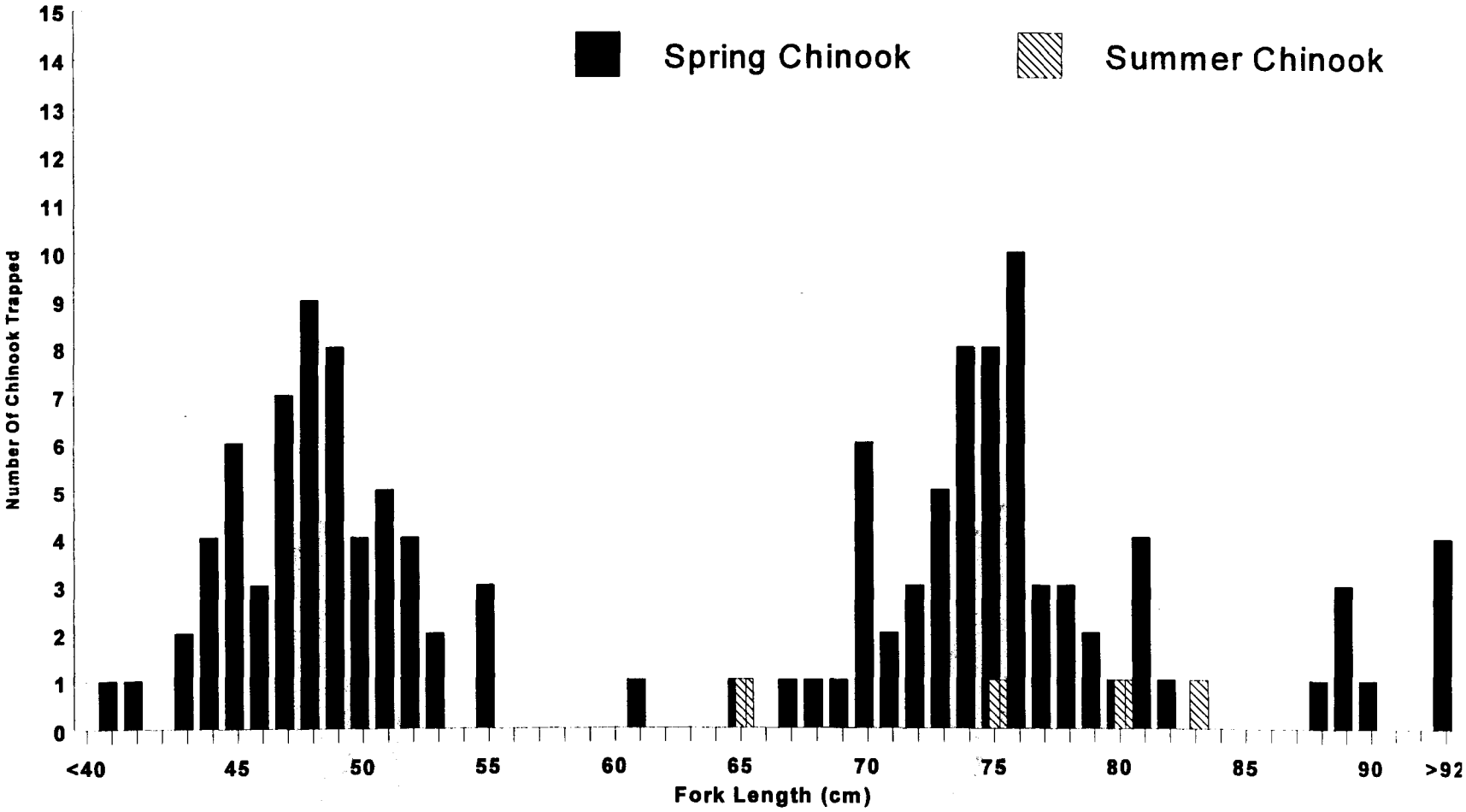
59 (45.73%)	three-year-old
61 (47.29%)	four-year-old
9 (6.98%)	five-year old
129 (100.00%)	total

Age-class Criteria

0 - 55 cm =	three-year old
56 - 86 cm =	four-year-old
87 - > =	five-year-old

*The sex ratio includes 35 fish received from Oxbow Hatchery.

Appendix 8. Length Frequency of Adult Chinook Returning to Rapid River Trap During 1995.



Appendix 9. Injuries to Returning Adult Chinook, 1995.

Trap/ Mark	Body Injury	Body Scar	Bite Wound	Jaw Damage	Fish Hook	Fungus	Gill Net	Nitrogen Blister	Pectoral Fin	Pelvic Fin
Rapid River										
Spring	6	15	7	1	0	0	1	1	1	1
Summer	0	2	0	0	0	0	0	1	0	0
Hells Canyon	0	0	0	0	0	0	0	0	0	0
Total	5	6	0	0	0	0	0	3	0	0

Numbers for Hells Canyon stock are courtesy of Oxbow Hatchery.

Appendix 10. Rapid River Summer Chinook Run Timing, 1995.

Week Ending	Number of Fish	Percent of Summer Chinook
May 27	0	0.00
June 3	0	0.00
June 10	0	0.00
June 17	0	0.00
June 24	0	0.00
July 1	0	0.00
July 8	0	0.00
July 15	0	0.00
July 22	2	50.00
July 29	0	0.00
August 5	0	0.00
August 12	0	0.00
August 19	0	0.00
August 26	1	25.00
September 2	0	0.00
September 9	1	25.00
September 16	0	0.00
Total	4	100.00

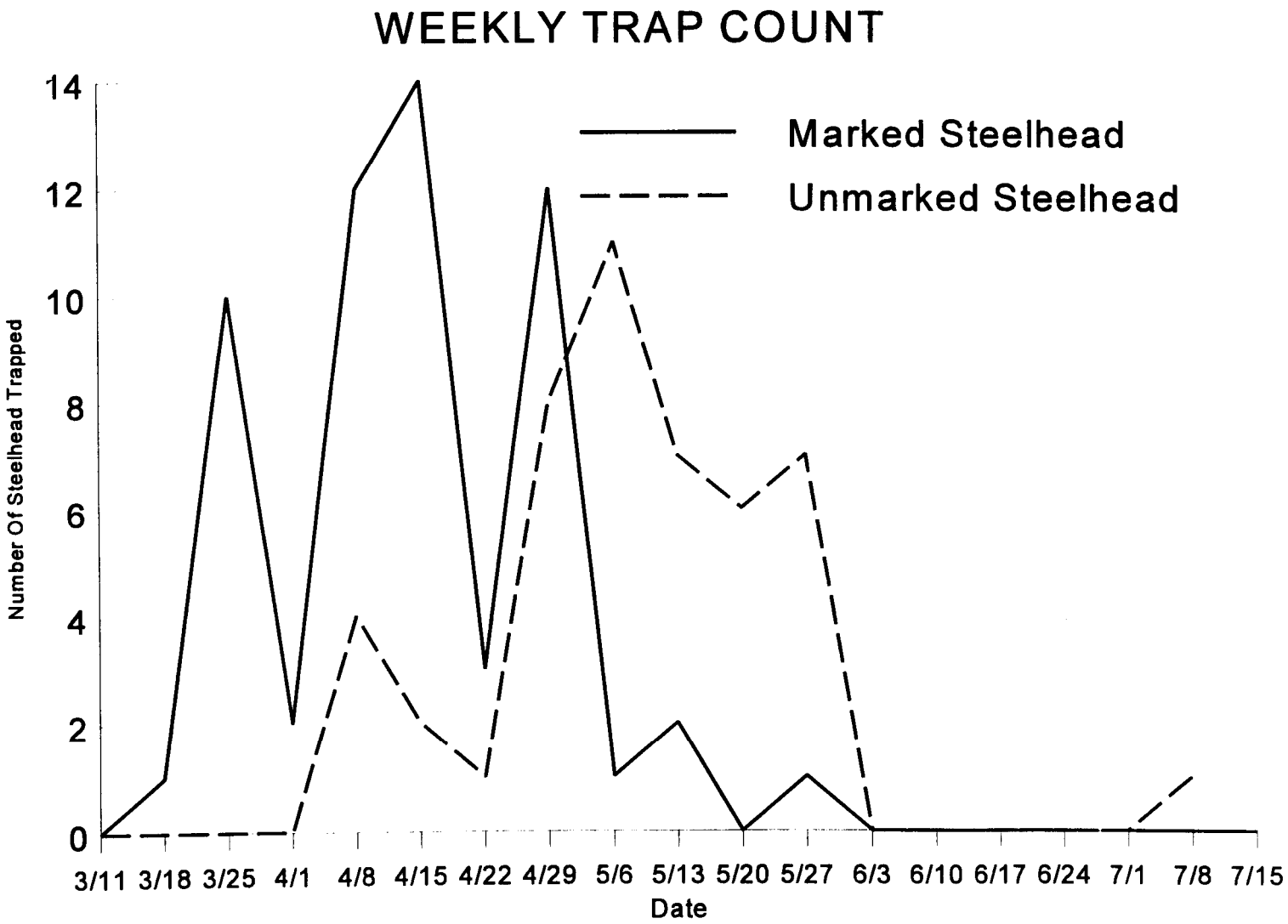
Appendix 11. Rapid River Summer Chinook Length Frequency, 1995.

Fork Length (cm)	Number of Fish	Fork Length (cm)	Number of Fish
less than 40	0	80	1
40	0	81	0
41	0	82	0
42	0	83	0
43	0	84	1
44	0	85	0
45	0	86	0
46	0	87	0
47	0	88	0
48	0	89	0
49	0	90	0
50	0	91	0
51	0	92	0
52	0	>92	0
53	0	Total Run	4
54	0		
55	0		
56	0	Sex composition data	
57	0	0 (0.00%)	jacks
58	0	4 (100.00%)	males
59	0	0 (00.00%)	females
60	0	4 (100.00%)	total
61	0		
62	0		
63	0		
64	0	Age class data	
65	1	0 (00.00%)	three-year-old
66	0	3 (75.00%)	four-year-old
67	0	1 (25.00%)	five-year old
68	0	4 (100.00%)	total
69	0		
70	0		
71	0		
72	0	Age class criteria	
73	0	0 - 53 cm =	three-year old
74	0	54 - 80 cm =	four-year-old
75	1	81 - > =	five-year-old
76	0		
77	0		
78	0		
79	0		

Appendix 12. Rapid River Steelhead Run Timing, 1995.

Week Ending	Number of Fish	Percent of Steelhead Run
March 11	0	0.00
March 18	1	0.95
March 25	10	9.52
April 1	2	1.90
April 8	16	15.24
April 15	16	15.24
April 22	4	3.81
April 29	20	19.05
May 6	12	11.43
May 13	9	8.57
May 20	6	5.71
May 27	8	7.62
June 3	0	0.00
June 10	0	0.00
June 17	0	0.00
June 24	0	0.00
July 1	0	0.00
July 8	1	0.95
July 22	0	0.00
Total	105	100.00

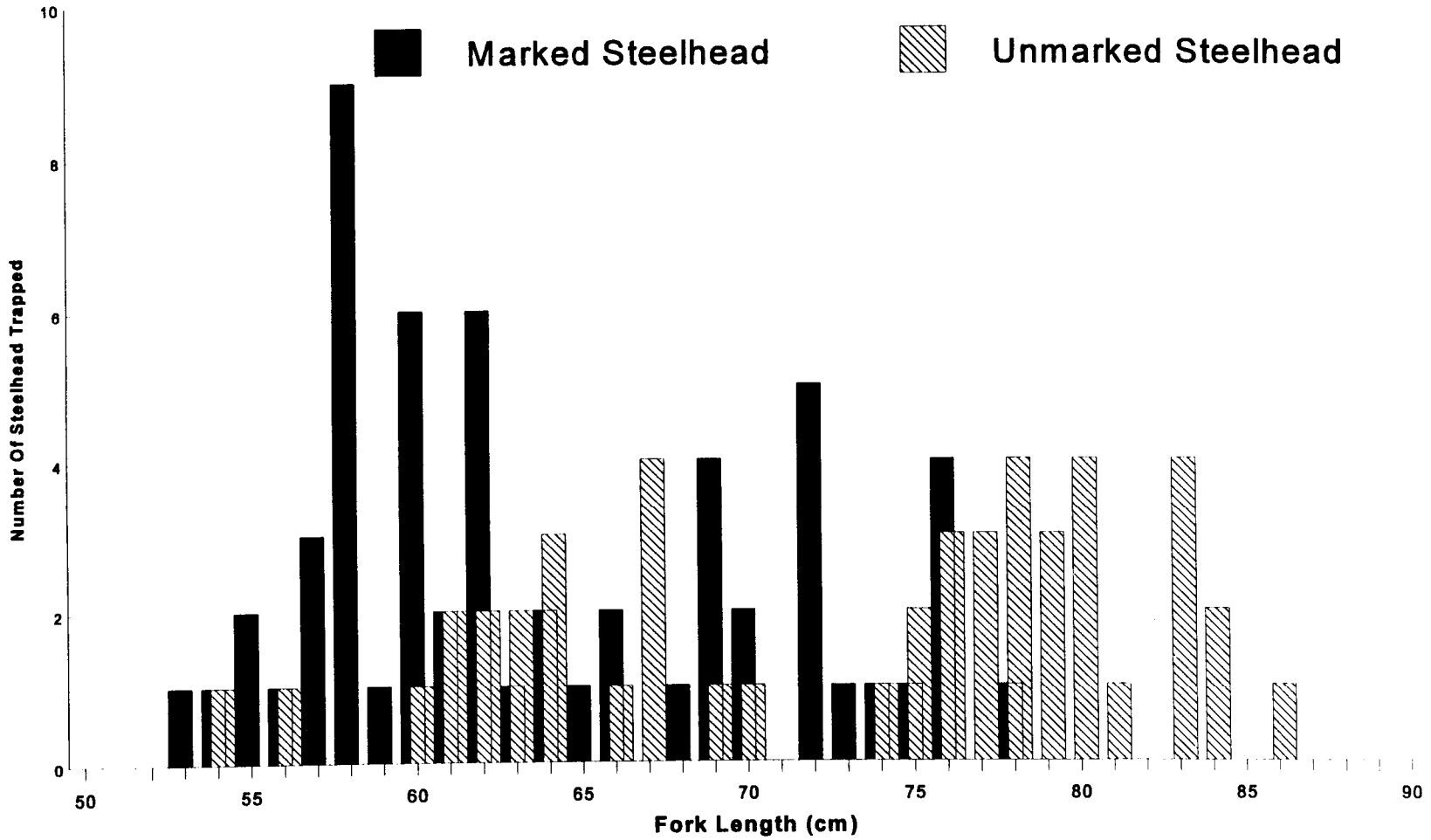
Appendix 13. Adult Steelhead Returns to Rapid River Trap During 1995.



Appendix 14. Rapid River Steelhead Length Frequency, 1995.

Fork Length (cm)	Hatchery		Wild	
	Male	Female	Male	Female
51				
52				
53		1		
54	1		1	
55		2		
56	1		1	
57	2	1		
58	5	4		
59		1		
60	2	4		1
61	2		2	
62	3	3	1	1
63	1		1	1
64		2		3
65	1			
66	2			1
67			1	3
68		1		
69	1	3	1	
70	1	1		1
71				
72	4	1		
73	1			
74	1		1	
75		1	1	1
76	3	1	1	2
77			2	1
78	1		1	3
79			2	1
80				4
81				1
82				
83			3	1
84			1	1
85				
86				1
87				
88				
89				
Total	32	26	20	27
Origin Total Column	58		47	
Total Run	105			

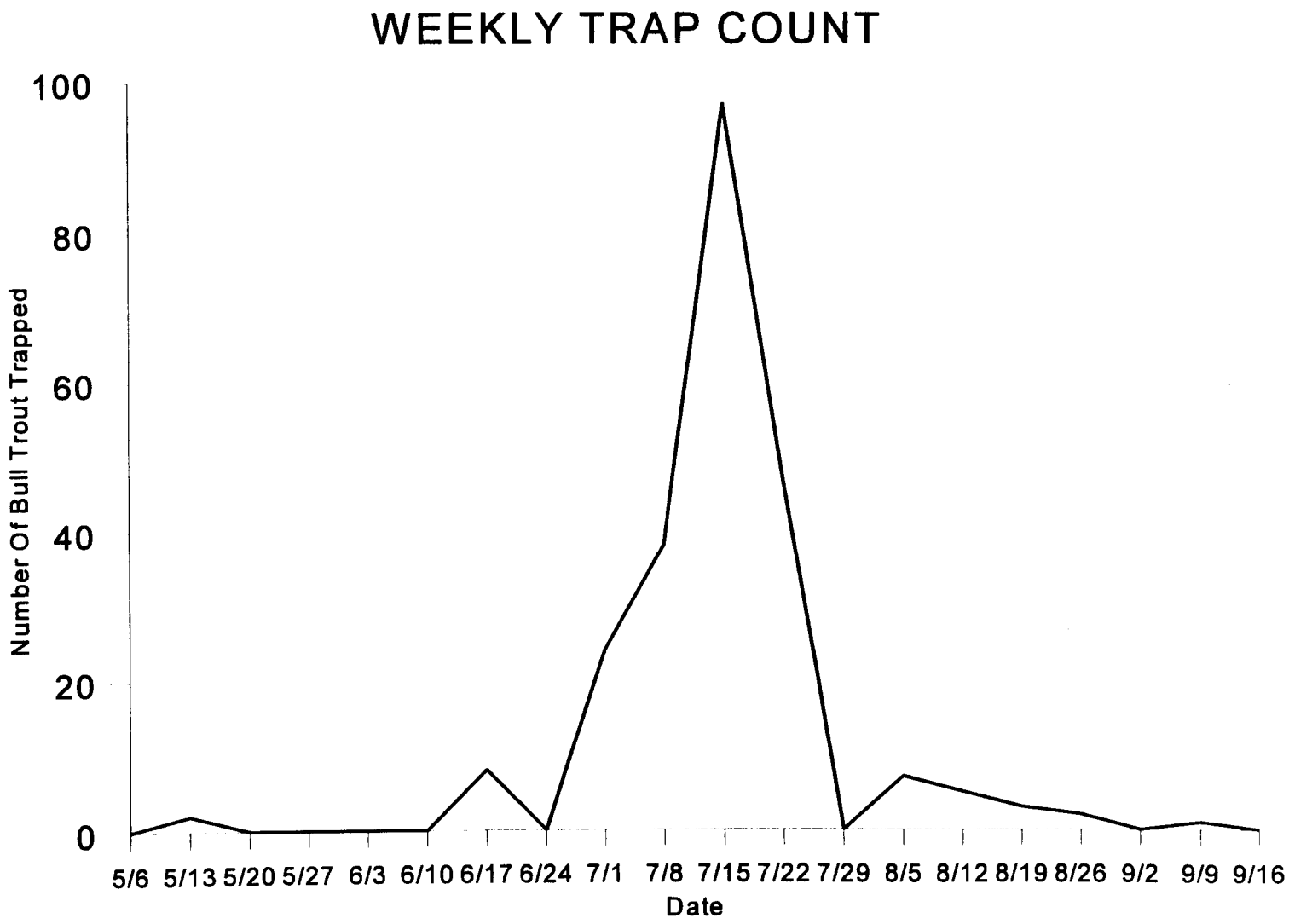
Appendix 15. Length Frequency of Steelhead Returning to Rapid River Trap During 1995.



Appendix 16. Rapid River Bull Trout Run Timing, 1995

Week Ending	Number of Fish	Percent of Bull Trout Run
May 6	0	0.00
May 13	2	0.85
May 20	0	0.00
May 27	0	0.00
June 3	0	0.00
June 10	0	0.00
June 17	8	3.42
June 24	0	0.00
July 1	24	10.26
July 8	38	16.24
July 15	97	41.45
July 22	47	20.09
July 29	0	0.00
August 5	7	2.99
August 12	5	2.14
August 19	3	1.28
August 26	2	0.85
September 2	0	0.00
September 9	1	0.43
September 16	0	0.00
Total	234	100.00

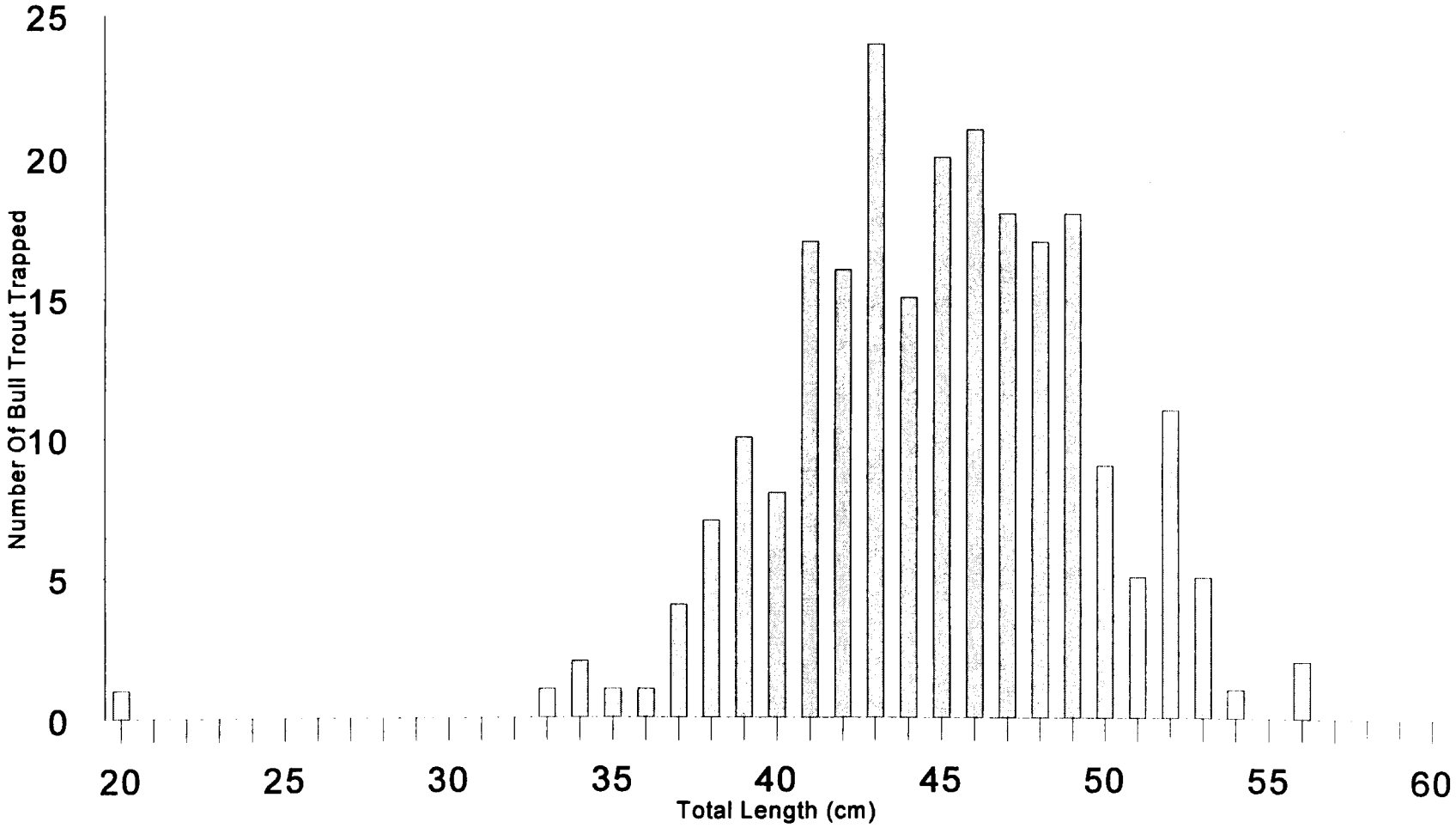
Appendix 17. Adult Bull Trout Returns to Rapid River Trap During 1995.



Appendix 18. Rapid River Bull Trout Length Frequency, 1995.

Total Length (cm)	Number of Fish	TotalLlength (cm)	Number of Fish
20	1	40	8
21	0	41	17
22	0	42	16
23	0	43	24
24	0	44	15
25	0	45	20
26	0	46	21
27	0	47	18
28	0	48	17
29	0	49	18
30	0	50	9
31	0	51	5
32	0	52	11
33	1	53	5
34	2	54	1
35	1	55	0
36	1	56	2
37	4	57	0
38	7	58	0
39	10	59	0
Total			234

Appendix 19. Length Frequency of Adult Bull Trout Returning to Rapid River Trap During 1995.



Appendix 20. Species Trapped in Rapid River, 1995.

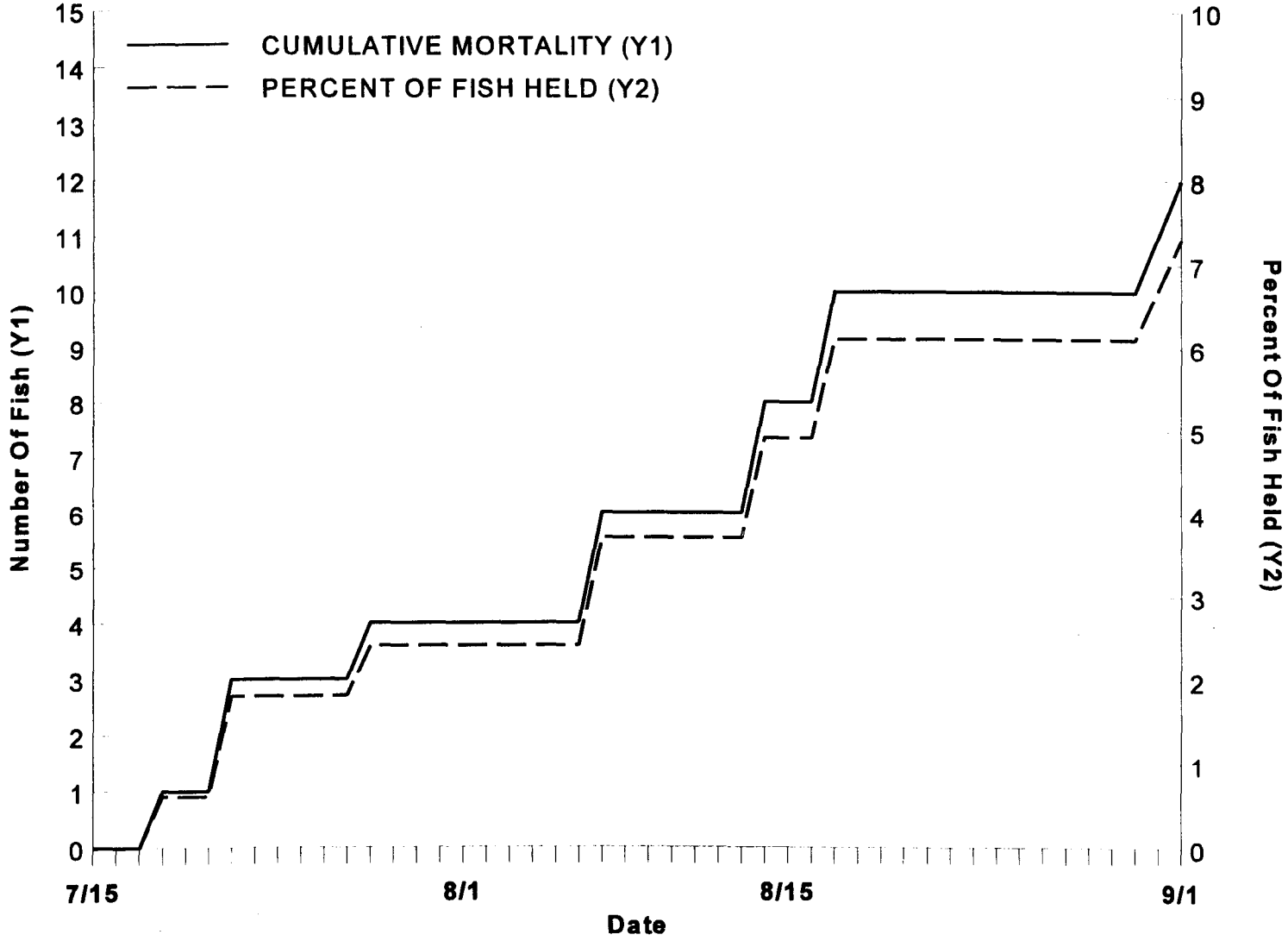
Species	Number Trapped
Spring chinook	129
Summer chinook	4
Steelhead	105
Bull trout	234

Appendix 21. Major Causes of Prespawning Adult Mortality, 1995.

Cause	Number of Fish	Percent of Fish Held
Unknown	2	1.2
BKD	2	1.2
Jaundice	0	0.0
Nitrogen burn	8	4.9
Wounds	0	0.0
Total	12	7.3

Seven of the mortalities caused by nitrogen burns were on Snake River fish. One prespawning mortality occurred at Oxbow Hatchery prior to transport and is not included in this table.

Appendix 22. Prespawning Mortality of Adult Salmon During 1995.



Appendix 23. Adults Recaptured With Coded-wire Tags, 1995.

Recapture Date	Species	Fork Length (cm)	CWT Number	Clip	Comments
1995	chinook	73	10-36-01	AD	male
1995	chinook	83	10-49-06	LV	female
1995	chinook	76	10-49-17	AD	female
1995	chinook	90	10-35-01	AD	female
1995	chinook	79	10-49-06	LV	female
1995	chinook	72	10-36-01	AD	female
1995	chinook	74	10-49-17	AD	female
1995	chinook	73	10-49-06	LV	female
1995	chinook	75	10-49-06	LV	female
1995	chinook	79	10-49-08	AD	female
1995	chinook	77	BLANK	AD	female
1995	chinook	78	10-49-17	AD	male
1995	chinook	78	10-49-11	LV	male
1995	chinook	80	10-36-01	AD	male
1995	chinook	94	10-35-01	AD	male
1995	chinook	68	10-49-07	LV	female
1995	chinook	71	10-49-08	AD	male
1995	chinook	79	10-49-17	AD	male
1995	chinook	80	10-36-01	AD	male
1995	chinook	73	10-36-01	AD	male
1995	chinook	48	10-49-03	AD	male
1995	chinook	69	10-49-21	LV	male
1995	chinook	74	10-49-10	LV	male
1995	chinook	85	10-49-10	LV	male
1995	chinook	73	10-49-17	AD	male
1995	chinook	43	10-19-03	AD	male
1995	chinook	73	10-49-22	AD	male
1995	chinook	56	10-49-03	AD	male
1995	chinook	47	10-49-03	AD	male
1995	chinook	52	10-49-07	LV	male
1995	chinook	76	10-49-06	AD	male

Appendix 24. Rapid River Hatchery Egg Enumeration, 1995.

Total Eggs Taken At Rapid River Hatchery In 1995.

Lot	Eyed	Bad	Green	Percent Eyed	Average Fecundity	Females
R1	2,905	2,297	5,202	55.8	5,202	1
R2	19,982	1,332	21,314	93.8	4,263	5
R3	5,069	111	5,180	97.9	5,180	1
R4	10,589	1,608	12,197	86.8	4,066	3
R5	14,442	1,464	15,906	90.8	3,977	4
R6	37,531	2,446	39,977	93.9	3,634	11
R7	1,088	3,636	4,724	23.0	4,724	1
R8	3,880	2,050	5,930	65.4	2,965	2
R9	10,928	935	11,863	92.1	2,966	4
R10	3,302	495	3,797	87.0	3,797	1
R11	2,825	247	3,072	92.0	3,072	1
R12	2,724	116	2,840	95.9	2,840	1
total	115,265	16,737	132,002	87.3	3,771	35

Eggs Transferred to Clearwater Hatchery in 1995.

Lot	Eyed	Bad	Green	Percent Eyed	Average Fecundity	Females
R4	2,486	1,213	3,699	67.2	3,699	1
R6	7,877	453	8,330	94.6	4,165	2
R9	3,214	260	3,474	92.5	3,474	1
R11	2,825	247	3,072	92.0	3,072	1
total	16,402	2,173	18,575	88.3	3,715	5

Eggs Retained at Rapid River Hatchery in 1995.

Lot	Eyed	Bad	Green	Percent Eyed	Average Fecundity	Females
RI	2,905	2,297	5,202	55.8	5202	1
R2	19,982	1,332	21,314	93.8	4263	5
R3	5,069	111	5,180	97.9	5180	1
R4	8,103	395	8,498	95.4	4249	2
R5	14,442	1,464	15,906	90.8	3977	4
R6	29,654	1,993	31,647	93.7	3516	9
R7	1,088	3,636	4724	23.0	4724	1
R8	3,880	2,050	5,930	65.4	2965	2
R9	7,714	675	8,389	92.0	2796	3
R10	3,302	495	3,797	87.0	3797	1
R12	2,724	116	2,840	95.9	2840	1
total	98,863	14,564	113,427	87.2	3,781	30

Appendix 25. Rapid River Hatchery Brood Stock ELISA Results, 1995.

Lot Number	Date Sampled	Negative		Positive		
		Number Sampled	<0.99	Low .1-.25	Moderate .26-.59	High >.60
RI	8/7	1			1	
R2	8/21	5	1	4		
R3	8/24	½		1		
R4	8/28	3		2		1
R5	8/31	4		4		
R6	9/5	11	1	8	2	
R7	9/7	1		1		
R8	9/11	2		2		
R9	9/22	4	1	2	1	
R10	9/28	1		1		
R11	10/3	1			1	
R12	10/10	1		1		
Total		35	3	26	5	1

Appendix 26. Initial Raceway Loading Densities, March 19, 1996.

Raceway	Inflow (cfs)	Number of Fish	Fish Per Pound	Density Index	Flow Inde
3	.18	24,734	576.0	0.12	0.30
5	.18	50,811	879.2	0.19	0.46

Appendix 27. Final Raceway Loading Densities, September 16, 1996.

Raceway	Inflow (cfs)	Number of Fish	FishPper Pound	Density Index	Flow Inde
3	.88	14,429	59.1	0.20	0.16
5	1.36	74,811	37.1	0.25	0.74

The number of fish in raceway 3 decreased from Appendix 26 because raceway 3 was combined with raceway 5, and fish were moved from indoor vats into raceway 3 on June 17, 1996.

Appendix 28. Initial Pond Loading Densities, October 1, 1996.

Pond	Inflow (cfs)	Number of Fish	Fish Per Pound	Density Index	Flow Inde
Pond 2A	2.50	83,719	34.0	0.02	0.48
Pond 2BCB	2.50	2,326	43.7	0.003	0.53

Appendix 29. Pond Loading Densities At Release, March 17, 1997.

Pond	Inflow (cfs)	Number of Fish	Fish Per Pound	Density Index	Flow Index
Pond 2A	5.90	83,544	20.5	0.033	0.30
Pond 2BCB	4.96	2,296	20.8	0.005	0.36

Appendix 30. Feed for Brood Year 1995 at Rapid River Hatchery.

Product		Amount Used	Unit Price	Total Cost
Type/size	**Additives**			
BioDiet:				
No. 2 Starter		17.6 kg	1.9200	33.79
NO. 3 Starter		40.0 kg	2.1600	86.40
1.0 mm Grower		80.0 kg	1.6900	135.20
1.3 mm Grower		90.0 kg	1.6300	146.70
1.5 mm Grower		116.0 kg	1.4900	172.84
1.5 mm Grower	2.25% Aquamycin	20.0 kg	3.1700	63.40
2.0 mm Grower		273.0 kg	1.4400	393.12
2.0 mm Grower	2.25% Aquamycin	167.0 kg	3.1700	529.39
2.0 mm Grower	2.0% TM-100	153.0 kg	2.7500	420.75
2.5 mm Grower		359.0 kg	1.3900	499.01
2.5 mm Grower	4.50% Aquamycin	320.9 kg	4.0900	1312.48
3.0 mm Grower		240.0 kg	1.3400	321.60
3.0 mm Grower	EIBS vitamin pac	900.0 kg	1.5270	1374.30
total for brood year 1995		2776.5		5488.98

EIBS vitamin pac: 5 x C and B12, and 10 x Folic Acid

Appendix 31. Department Eagle Fish Health Laboratory Inspection Results for Brood Year 1995.

Brood Year Stock	Log Number	IHN	IPN	EIBS	BKD	FUR	ERM	CWD	WHD	CSH	Comments
Juvenile samples											
95RRSC	96-175	-	-		-	-	-	-			NO PATHOGENS DETECTED FAT 0/15, VIRO 0/10,BACTE 0/4
95RRSC	96-219	-	-		-	-	-	-			NO PATHOGENS DETECTED; VIRO 0/10, BACTE 0/8
95RRSC	96-253	-	-		-	-	-	-			NO PATHOGENS DETECTED; VIRO 0/10, FAT 0/10, BACTE 0/8
95RRSC	96-404	-	-		-	-	-	-			NO PATHOGENS DETECTED; VIRO 0/10, FAT 0/10, BACTE 0/4
95RRSC	96-485	-	-		-	-	-	-			NO PATHOGENS DETECTED; VIRO 0/10, FAT 0/10, BACTE 0/8
95RRSC	96-529				-						OPEN CASE; FAT 0/5
95RRSC	97-038	-	-		+				-		RS; ELISA 2/4 LOW (5 FISH POOLS), FAT 0/20, VIRO 0/20 WHD 0/20
Brood samples											
RRSC	95-364				+				-		RS; ELISA 1/1 MOD. WHD 0/1. HISTO- NO SPORES SEEN
RRSC	95-370	+	-		+				-		RS; ELISA 4/5 LOW, IHN 1/5, IPN 0/5, WHD 0/5, HISTO- NO SPORES SEEN
RRSC	95-375	-	-		+				-		RS; ELISA 1/1 LOW, VIRO 0/1
RRSC	95-386	-	-		+				-		RS; ELISA 3/3(2LOW,1HIGH), VIRO 0/3, WHD 0/3, HISTO- NO SPORES SEEN
RRSC	95-392	-	-		+				-		RS; ELISA 4/5 LOW, WHD 0/6, VIRO 0/4, HISTO- NO SPORES SEEN
RRSC	95-410	+	-		+				-		IHN, RS; ELISA 10/11(8 LOW, 2MOD), IHNV 1/11, IPN 0/11, WHD 0/11, HISTO- NO SPORES SEEN
RRSC	95-414	-	-		+						RS; WHD 0/1, ELISA 1/1 LOW, MYXOBOLUS NOT DETECTED IN DIGEST OR HISTOLOGOCAL EXAM
RRSC	95-449	-	-		+				-		RS; ELISA 3/4(2 LOW, 1 MOD), WHD 0/4, HISTO- NO SPORES SEEN
RRSC	95-494				+				-		RS; ELISA 5/5(4 LOW, 1 MOD), WHD 0/1

Appendix 32. Pre-Liberation Organosomatic Index, Brood Year 1995.

Hematology						
	Hematocrit			Serum protein		
Date	[a]Mean	[b]SD	[c]CF	[a]Mean	[b]SD	[c]CF
02/27/97	45.80	3.08	0.07	NA	NA	NA

[a]20 fish pool
[b]Standard deviation
[c]Coefficient of variation

Combined autopsy summary

Eyes	Gills	Pseudo-Branchs	Thymus	Mesn. Fat	Spleen	Hind Gut	Kidney	Liver	Bile
N 20	N 20	N 20	0 20	0 0	B 0	0 20	N 20	A 0	0 0
B1 0	F 0	S 0	1 0	1 0	R 20	1 0	S 0	B 2	1 0
B2 0	L 0	L 0	2 0	2 1	G 0	2 0	M 0	C 18	2 0
E1 0	C 0	S&L 0		3 13	NO 0		G 0	D 0	3 0
E2 0	M 0	I 0		4 6	E 0		U 0	E 0	
H1 0	P 0	OT 0			OT 0		OT 0	F 0	
H2 0	OT 0	O 0						OT 0	
M1 0									
M2 0									
OT 0									

Summary of normals

20	20	20	20	20	20	20	20	20	0

N= normal
F= frayed
OT= other
Thymus: 0= no hemorrhage
Mesenteric fat: 0= none, 1= <50% coverage, 2= 50%, 3= >50%, 4= 100%
Spleen: R= red, E= enlarged (EIBS enlarges spleens)
Hind gut: 0= no inflammation
Liver: B= pail red
Bile: 0= yellow bile <full bladder

Appendix 33. Rapid River Hatchery Marking Summary, Brood Year 1995.

Adipose Fin-clipped Fish Releases

Release Site	Date Released	Marked Fish Released	Release Group Mark Code	Clip	Purpose	Pond
Rapid River	3/17-4/10/97	83,544	Ad only	Ad	Hatchery ID	2A
Rapid River	3/17	2,296	Ad only	Ad	Hatchery ID	2BCB

Pit Tag Releases

Release Site	Date Released	*PIT Tagged Fish Released	Release Group Mark code	Clip	Purpose	Pond
Rapid River	3/17-4/10/97	40,294	Ad only	Ad	Hatchery PIT tag study and FPC	2A

*The number of PIT tagged fish released is the number PIT tagged, minus documented mortality of PIT tagged fish.

Appendix 34. Smolts Released From Rapid River Hatchery in 1997 (Brood Year 1995).

Release Site Date	Release Method	Number Release	Number of Fish Per Pound
Rapid River			
3/17-4/10/97	Volitional release pond 2A	62,658	20.5
	Volitional release subtotal	62,658	
4/10/97	Smolts flushed pond 2A	20,886	20.5
3/17/97	Smolts flushed pond 2BCB	2,296	20.8
	Pond flush subtotal	23,182	
Site total	number released	85,840	20.5
Hatchery total number released		85,840	20.5
	pounds released	4,185	

Appendix 35. Survival from Eggs To Smolts at Rapid River Hatchery Brood Year 1995.

[a]Green Eggs	Eyed Egg Number	Percent Survival	Swim Up	[b]Percent Survival	[c]Marked Number	Released Smolts	[d]Percent Survival
113,427	98,863	87.2	97,852	86.3	86,072	85,840	99.7

[a]Green eggs retained by Rapid River Hatchery after segregation of 18,575 green eggs for transfer Clearwater Hatchery.

[b]Percent survival from green eggs to swim-up.

[c]the reported number marked was 8.4% less than hatchery inventory at the time of marking.

[d]Percent survival from marking to release.

Appendix 36. Cost Of Production Rapid River Hatchery Brood Year 1995.

Number of Fish	Pounds of Fish	Pounds of Feed	Cost of Feed	[a]Feed Conversion	[b]Total Cost	Cost per Thousand	Cost Per Pound
85,840	4,185	6,118	$5488.96	1.38	$587,737.15	$6,846.89	$140.44

[a]Feed conversion is based on feed used prior to release. An additional 315.5 lbs was fed during release and is not included in this calculation.

[b]The figure $587,737.15 represents the total cost incurred by IPC from 9/1/95 through 3/31/97. This amount may be inflated due to overlap in the brood year rearing cycle (see the discussion in the Smolt Release section). These costs include funds provided to the Department by IPC, as well as internal costs incurred by IPC.

Appendix 37. Returns to Rapid River Hatchery, 1964-1996.

Return Year	Snake R. Return (Adults)	Rapid R. Return (Adults)	Rapid R. Return (Jacks)	Percent Prespawnlng Mortality	Females Spawne	Eggs/ Female	Number of Eggs Taken
1964	349			16	182	4,874	887,000
1965	408			21	133	4,541	604,000
1966	1,5111			18	621	3,697	2,296,000
1967	974	1,039		11	581	3,537	2,055,000
1968	351	3,416	740	2	1,809	3,671	6,540,000
1969	672	2,817	1,043	8	1,415	3,655	5,151,697
1970		6,470	887	10	3,520	4,136	14,560,280
1971		3,357	1,754	19	1,722	3,507	6,038,785
1972		12,310	943	15	3,825	3,941	15,072,604
1973		17,054	286	37	3,454	3,912	13,510,465
1974		3,457	538	27	1,756	3,924	6,890,186
1975		4,428	573	7	2,184	3,894	8,503,606
1976		6,342	1,765	15	3,055	3,762	11,492,878
1977		7,767	437	11	3,781	3,745	14,160,330
1978		5,735	34	21	2,350	4,266	10,026,888
1979		3,054	350	31	1,141	4,950	5,648,722
1980		1,528	432	30	543	3,235	1,756,827
1981		3,087	176	7	1,666	3,675	6,122,273
1982		3,646	30	11	1,883	3,973	7,482,330
1983		1,864	94	15	859	4,015	3,449,471
1984		1,705	651	7	821	3,807	3,125,911
1985	673	6,376	351	8	2,962	3,741	11,535,461
1986	360	6,546	177	34	2,451	4,355	10,673,138
1987	534	3,808	210	30	1,133	4,379	5,656,145
1988	381	3,608	172	19	1,645	4,879	7,905,702
1989	86	2,372	428	11	1,082	4,139	4,478,045
1990		2,566	40	13	1,063	3,967	4,217,103
1991		1,675	238	10	657	3,886	2,553,218
1992	912	2,370	96	24	1,177	3,988	4,534,404
1993	411	4,451	17	17	1,737	4,090	6,404,312
1994	29	261	4	21	116	4,226	490,249
1995	35	70	59	7	35	3,771	132,002
1996	58	1,412	751	6	329	3,561	1,171,610

From 1985 on, total eggs taken includes Snake River adults.

Appendix 38. Summary of Returns to Rapid River Hatchery by Brood Year.

Brood Year	Year Released	Number Released	3 Year Olds	Year Returned	4 Year Olds	Year Returned	5 Year Olds	Year Returned	Return From Release	% Return From Release
1964	1966	588,000	1,309	1967	3,422	1968	197	1969	4,658	0.00
1965	1967	479,267	740	1968	2,620	1969	874	1970	4,234	0.89
1966	1968	1,460,150	1,043	1969	5,596	1970	364	1971	7,003	0.48
1967	1969	900,192	887	1970	2,992	1971	1,544	1972	5,416	0.60
1968	1970	3,172,000	1,754	1971	10,766	1972	4,403	1973	16,923	0.53
1969	1971	2,718,720	943	1972	12,654	1973	1,759	1974	15,356	0.56
1970	1972	2,809,200	285	1973	1,698	1974	386	1975	2,370	0.08
1971	1973	2,908,425	538	1974	4,206	1975	1,120	1976	5,864	0.20
1972	1974	2,707,917	573	1975	5,222	1976	634	1977	6,429	0.24
1973	1975	3,373,700	1,765	1976	7,110	1977	1,845	1978	10,720	0.32
1974	1976	3,358,940	437	1977	3,890	1978	2,413	1979	6,740	0.20
1975	1977	2,921,172	34	1978	598	1979	46	1980	678	*0.02
1976	1978	2,412,678	350	1979	1,482	1980	146	1981	1,978	0.08
1977	1979	2,866,993	432	1980	3,068	1981	557	1982	4,057	0.14
1978	1980	2,604,823	176	1981	3,089	1982	1,206	1983	4,291	0.16
1979	1981	2,372,607	30	1982	838	1983	356	1984	1,224	0.05
1980	1982	1,476,766	94	1983	1,349	1984	199	1985	1,642	0.11
1981	1983	2,998,103	651	1984	6,177	1985	1,456	1986	8,284	0.28
1982	1984	3,246,197	351	1985	5,090	1986	1,155	1987	6,596	0.20
1983	1985	2,491,238	177	1986	2,444	1987	1,557	1988	4,178	0.17
1984	1986	1,594,688	210	1987	2,051	1988	379	1989	2,640	0.17
1985	1987	2,836,400	172	1988	1,933	1989	135	1990	2,300	0.08
1986	1988	2,630,200	428	1989	2,431	1990	421	1991	3,080	0.12
1987	1989	2,319,500	40	1990	1,254	1991	161	1992	1,455	0.06
1988	1990	2,520,400	238	1991	2,209	1992	1,905	1993	4,352	0.17
1989	1991	2,564,900	96	1992	2,546	1993	122	1994	2,764	0.11
1990	1992	2,615,500	17	1993	139	1994	9	1995	165	0,006
1991	1993	2,060,300	4	1994	61	1995	2	1996	1,412	0.04
1992	1994	2,928,146	59	1995	659	1996		1997		
1993	1995	3,286,455	751	1996		1997		1998		
1994	1996	379,167		1997		1998		1999		
1995	1997	85,840		1998		1999		2000		

*Lower Granite Dam completed 1975.

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Appendix 39. Average Feed and Growth Data for Rapid River Hatchery 1980-1995.

Month	Average Water Temperature (F)	Density Index	Flow Index	Feed Conv	Hatchery Constant	Daily Length Increase	Monthly Length Increase	Condition Factor	Percent Body Weight Fed	Number Feedings Per Day	Average #/lb. At End Of Month	Average Length at End Of Month
FEB	38	N.A.	N.A.	N.A.	1.98	0.0024	0.07	0.00027	1.42	8	1109	1.50
MAR	41	0.24	0.59	1.07	2.26	0.0070	0.20	0.00028	1.89	8	809	1.64
APR	44	0.29	0.64	1.02	3.23	0.0105	0.34	0.00031	2.40	8	439	1.95
MAY	46	0.29	0.74	1.00	4.54	0.0151	0.29	0.00031	2.30	8	271	2.29
JUN	49	0.0	0.69	1.20	7.10	0.0297	0.59	0.00031	2.93	4	136	2.87
JUL	54	0.09	0.83	1.59	7.36	0.0155	0.47	0.00036	2.75	4	79	3.43
AUG	55	0.12	1.33	1.59	7.82	0.0164	0.50	0.00035	2.70	5	49	3.86
SEP	51	0.15	1.57	1.70	8.66	0.0170	0.51	0.00035	2.00	5	36	4.31
OCT	46	0.16	1.69	1.71	5.03	0.0098	0.30	0.00035	1.37	3	30	4.60
NOV	51	0.17	1.81	2.22	1.54	0.0023	0.07	0.00035	0.47	2	28	4.67
DEC	38	0.17	1.88	4.46	2.12	0.0016	0.03	0.00034	0.21	1	30	4.67
JAN	37	0.18	1.89	2.83	1.15	0.0013	0.03	0.00034	0.21	1	29	4.69
FEB	38	0.18	2.01	1.24	1.47	0.0040	0.12	0.00032	0.53	2	26	4.95
MAR	41	0.19	1.97	1.55	3.47	0.0074	0.22	0.00032	0.92	2	22	5.19

Feed conversion is expressed as actual feed weight over weight gain from January 1990-July 1995.
Growth data may vary during periods of high water.

Appendix 40. Release and Transfer Summary for Rapid River Hatchery, 1964-1996.

Brood Year	No. Eggs Taken	Egg or Fry Plants and Site			Smolt Plants and Site		Fish/ Pound
1964	887,000	None			588,000	Rapid River	22.6
1995	60,400	**None**			479,267	Rapid River	23.2
1966	2,296,000	**None**			1,460,150	Rapid River	25.0
1967	2,055,000	None			900,192	Rapid River	24.0
1968	6,540,000	757,376	**eggs**	Clearwater H Channel	3,172,000	Rapid River	20.0
1969	5,171,697	497,000	eggs	Dworshak NFH to start Kooskia	2,718,720	Rapid River	21.0
1970	**14,560,280**	**4,417,454**	**eggs**	Sweetwater Eye Stat.	2,809,200	Rapid River	19.4
		2,224	**eggs**	Kooskia NFH.	91,800	Lochsa River	19.4
		526,516	eggs	**Hayden** Cr. Hatchery			
		2,473,983	eggs	**Clearwater** H Channel			
		4,607,736	eggs	Rapid River Hatchery			
		200,520	fry	Lemhi River			
		353,970	fry	Decker Pond			
		100,000	fry	**Sandpoint** Hatchery			
1971	**6,038,785**	**600,000**	eggs	**Hayden** Cr. Hatchery	**2,908,425**	**Rapid** River	17.0
		53,562	fry	Lemhi River	**197,303**	SF **Clearwater**	
		104,300	fry	**Red** River			
		29,800	fry	Ten Mile Creek			
		44,700	fry	American River			
		14,900	fry	**Papoose** Creek			
		59,600	fry	Brushy Creek			
		44,700	fry	Fish Creek			
		14,900	fry	Post Office Creek			
		44,700	fry	**Squaw** Creek (Lochsa)			
		61,500	fry	Lochsa River			
		60,000	fry	Ten Mile Creek			
		200,000	fry	**Sandpoint Hatchery**			
		401,305	fry	Decker **Pond**			
1972	**15,072,604**	**5,256,662**	eggs	**Sweetwater Eye Stat.**	2,707,917	**Rapid** River	17.5
		3,012,358	eggs	Hayden Creek Hatchery			
		1,293,592	eggs	Red River H Channel			
1973	**13,510,464**	**3,915,900**	eggs	**Sweetwater Eye Stat.**	3,373,700	Rapid River	14.8
		1,295,424	eggs	**Hayden** Creek Hatchery	117,000	SF **Clearwater**	
		104,760	eggs	Hagerman Hatchery			
		502,200	eggs	**Crooked** R. H Channel			
		702,000	**eggs**	**Kooskia** NFH			
		806,400	**eggs**	Hayden Creek Hatchery			
		504,000	eggs	**Minnesota walleye trade**			
		210,734	fry	**Sandpoint** Hatchery			
		206,360	fry	**Kooskia** NFH			
		88,480	fry	Ten Mile Creek.			
		18,200	fry	**Newsome** Creek			
		633,000	fry	Lemhi River			
		10,428	fry	**Capehom** Creek			
1974	**6,890,186**	**809,400**	eggs	Hayden Creek Hatchery	**3,358,940**	**Rapid** River	18.4
		407,012	**eggs**	Indian Creek	205,700	SF **Clearwater**	
		203,500	fry	**Sandpoint** Hatchery			
		21,840	fry	**Capehom** Creek			
		59,962	fry	**Red** River			
		30,750	fry	**Newsome** Creek			
		10,250	fry	Ten Mile Creek			
		1,140,300	fry	Lemhi River			

Appendix 40. Release and transfer summary for Rapid River Hatchery (cont).

Brood Year	No. Eggs Taken	Egg or Fry Plants and Site			Smolt Plants and Site		Fish/ Pound
1975	**8,503,606**	2,363,200	**eggs**	Sweetwater Eye Stat.	2,921,172	Rapid River	15.9
		252,200	**eggs**	Mullan Hatchery	249,750	SF Clearwater	
		255,000	**eggs**	Hayden Creek Hatchery			
		280,659	**eggs**	Indian Creek H Chan.			
		4,906,492	**eggs**	Rapid River Hatchery			
		34,000	fry	Ten Mile Creek			
		156,000	fry	Lemhi River			
		65,960	fry	SF **Clearwater** River			
		412,800	fry	Decker Pond			
		209,950	fry	**Sandpoint** Hatchery			
		36,143	fry	Bear Valley Creek			
1976	**11,492,878**	**1,161,608**	eggs	Mullan Hatchery	2,413,678	Rapid River	15.7
		2,937,994	eggs	**Sweetwater Eye Stat.**			
		261,900	**eggs**	**Hayden** Creek Hatchery			
		261,900	eggs	**Sandpoint** Hatchery			
		1,267,208	eggs	Mackay Hatchery			
		47,008	fry	Univ. of Idaho			
		3,111,850	fry	Mackay Hatchery			
		104,500	fry	**Lolo** Creek			
		501,600	fry	**Red River Pond**			
		80,600	fry	**SF Clearwater**			
1977	**14,160,330**	**2,633,400**	**eggs**	**Sweetwater Eye Stat.**	**2,866,993**	**Rapid** River	15.0
		2,287,800	**eggs**	**Kooskia** NFH	**156,362**	White Sand Cr.	
		2,689,000	eggs	Mullan Hatchery	**44,373**	**Newsome** Creek	
		288,000	eggs	Hayden Creek Hatchery			
		20,700	eggs	Univ. of Idaho			
		1,007,340	eggs	**Crooked** River H Chan.			
		723,000	fry	**Mackay** Hatchery			
		50,800	fry	Decker **Pond**			
		200,025	fry	**Red River Pond**			
		265,600	fry	Lemhi River			
1978	**10,026,888**	767,322	**eggs**	**Hayden** Creek Hatchery	**2,604,823**	**Rapid** River	15.0
		970,728	**eggs**	**Mackay Hatchery**	**57,440**	White **Sand** Cr.	
		1,540,282	**eggs**	**Sweetwater Eye Stat.**			
		706,936	**eggs**	Dworshak NFH			
		38,160	**eggs**	**Univ. Of Idaho**			
		10,864	**eggs**	U of 1 **Hayden** Cr.			
		1,250,010	eggs	**Crooked** River H Chan.			
		249,696	**eggs**	**Sweetwater Eye Stat.**			
		232,500	fry	**Red River Pond**			
		10,000	fry	Ten Mile Creek			
1979	**5,646,722**	**806,400**	eggs	**Hayden** Creek Hatchery	2,372,607	**Rapid** River	17.9
		330,880	eggs	Dworshak NFH	1,001,700	**Snake** River	21.0
		293,249	fry	**Red River Pond**			
1980	1,756,827	**None**			**1,473,733**	**Rapid** River	28.0
1981	6,122,273	**608,384**	**eggs**	**Pahsimeroi Hatchery**	**2,998,103**	**Rapid** River	22.0
		256,608	eggs	**Oxbow Hatchery**	250,020	**Snake** River	27.0
		449,280	eggs	Dworshak NFH			
1982	7,420,450	**493,346**	eggs	Looking Glass (Ore)	**3,246,197**	Rapid River	20.0
		1,332,200	**eggs**	Pahsimeroi Hatchery	**500,850**	**Snake** River	27.0
		375,028	**eggs**	Dworshak NFH			
		125,055	eggs	**Hagerman** NFH			
		306,000	fry	Red River Pond			

Appendix 40. Release and Transfer Summary for Rapid River Hatchery (cont).

Brood Year	No. Eggs Taken	Egg or Fry Plants and Site			Smolt Plants and Site		Fish/ Pound
1983	**3,449,471**	**None**			**2,491,238**	Rapid River	23.0
					437,360	**Snake** River	27.0
1984	3,125,911	152,000	fry	**Red** River	**159,688**	**Rapid** River	22.0
					140,000	Snake River	20.0
					136,000	Red River	30.0
1985	**11,535,461**	**497,520**	eggs	Oregon	2,630,200	**Rapid** River	22.5
		3,668,000	**eggs**	Dworshak NFH	103,000	Snake River	31.1
		2,450,907	**eggs**	**Sawtooth** Hatchery			
		100,590	fry	**Boulder** Creek			
		349,650	fry	Crooked River			
		200,158	fry	Eldorado Creek			
		55,123	fry	**Hopeful** Creek			
		144,443	fry	Crooked Fork Creek			
		70,282	fry	White Sand Creek			
		49,437	fry	Ten Mile Creek			
		102,282	fry	**Newsome** Creek			
		115,352	fry	Brushy Fork Creek			
1986	**10,673,138**	**2,368,400**	**eggs**	Dworshak NFH	2,630,200	**Rapid** River	19.0
		712,905	**eggs**	**Sawtooth** Hatchery	**400,600**	**Snake** River	19.8
		348,600	fry	Crooked Fork Creek			
		202,400	fry	White Sand Creek			
		98,000	fry	Big Flat Creek			
		238,900	fry	**Red River Pond**			
1987	**5,656,145**	**30,000**	fry	Little Salmon River	**2,319,500**	**Rapid** River	22.0
		103,800	fry	**Lolo** Creek	500,000	**Snake** River	20.
		137,800	fry	Eldorado Creek			
		62,200	fry	Crooked Fork Creek			
		108,300	fry	**Hopeful** Creek			
		72,200	fry	White Sand Creek			
		19,500	fry	Big Flat Creek			
		113,800	fry	American River			
		112,100	fry	**Newsome** Creek			
		100,100	fry	**Meadow** Creek			
		200,100	fry	Crooked River			
		50,100	fry	**Red** River			
		50,100	fry	**Yankee Fork**			
		202,000	fry	Brushy **Fork**			
		150,100	fry	Ten Mile Creek			
		100,200	fry	White Sand Creek			
1988	**7,881,379**	1,475,677	**eggs**	Oregon Fish **and Game**	2,520,400	**Rapid** River	26.0
		149,570	fry	Little Salmon River	**250,000**	Little **Salmon**	27.8
		100,278	fry	Ten Mile Creek	**551,200**	**Snake** river	30.0
		149,570	fry	Little Salmon River			
		100,278	fry	Ten Mile Creek			
		101,062	fry	Crooked River			
		100,862	fry	**Crooked River**			
		100,628	fry	**Newsome** Creek			
		100,299	fry	**Boulder** Creek			
		100,342	fry	**Boulder** Creek			
		100,097	fry	**Newsome** Creek			
		195,398	fry	Brushy **Fork**			
		99,919	fry	White Sand Creek			

Appendix 40. Release and Transfer Summary for Rapid River Hatchery (Cont).

Brood Year	No. Eggs Taken	Egg or Fry Plants and Site			Smolt Plants and Site		Fish/ Pound
1988		100,148	fry	White Sand Creek			
		99,401	fry	American River			
		51,369	fry	American River			
		39,163	fry	**Meadow** Creek			
1989	**3,925,585**	**211,509**	fry	**Crooked** River	**256,490**	Rapid River	24.2
		548,876	fry	Sawtooth Hatchery	100,100	Little Salmon	22.5
					500,500	**Snake** River	22.5
1990	4,271,103	200,000	eggs	Looking Glass Hatch.	2,615,500	Rapid River	20.3
		403,400	fry	Sawtooth Hatchery	**500,500**	Snake River	20.3
1991	**2,553,218**	**3,050**	fry	**Hayden** Creek Hatchery	2,060,300	**Rapid** River	24.7
		10,126	fry	**Squaw** Creek	200,300	Snake River	26.8
		90,125	fry	White Sand Creek			
1992	**4,534,404**	**92,897**	eggs	Dworshak Hatchery	**2,547,624**	Rapid River	20.4
					380,600	**Snake** River	20.5
1993	**6,404,312**	2,176,157	eggs	**Clearwater** Hatchery	**2,786,919**	Rapid River	18.5
					499,536	**Snake** River	19.1
1994	**490,249**	**58,791**	**eggs**	**Clearwater** Hatchery	**379,167**	**Rapid** River	16.8
1995	132,002	**16,402**	**eggs**	**Clearwater** Hatchery	**85,840**	**Rapid** River	20.5
1996	1,171,610	**168,754**	eggs	**Clearwater** Hatchery			

Submitted by:

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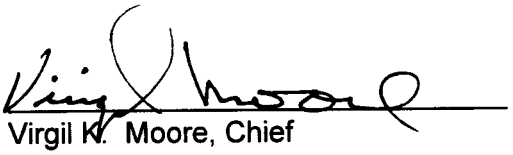

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